FLEXIBLE GEO-SOCIO GROUP QUERIES WITH KEYWORDS

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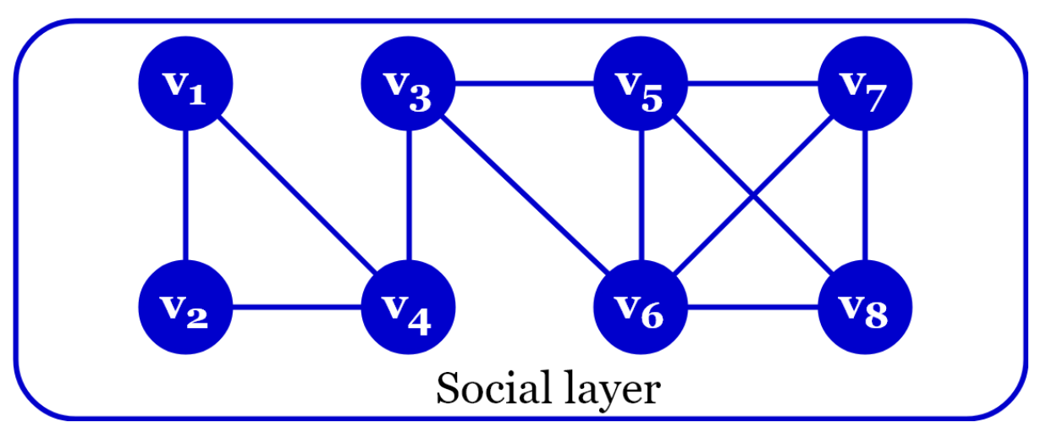
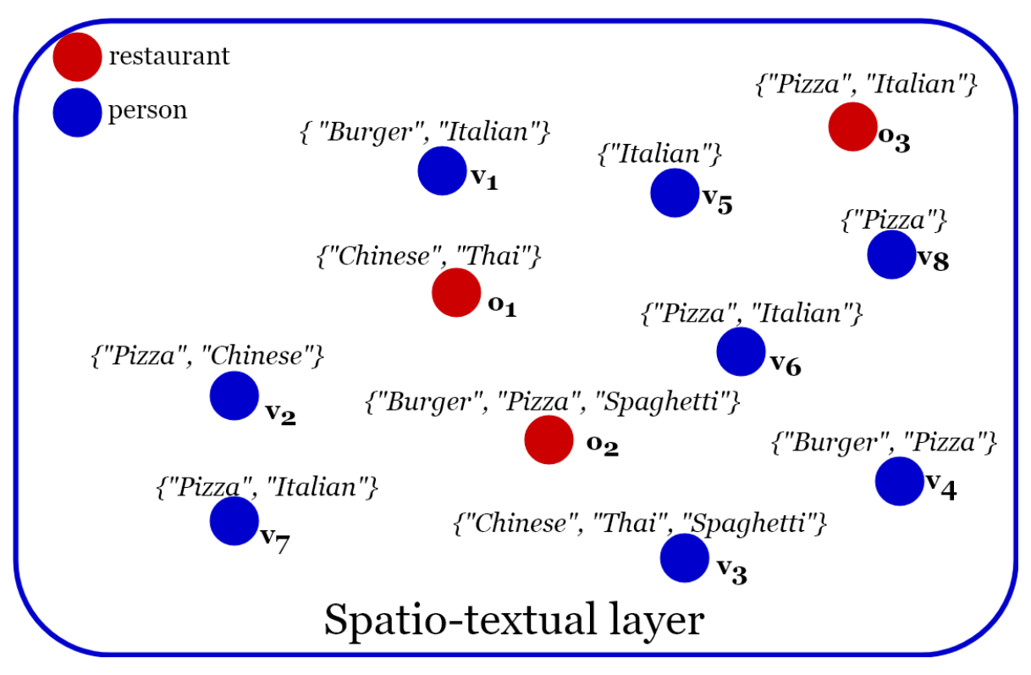
1 PROBLEM OVERVIEW

Efficiently finding the top groups (i.e. subgraphs) in large geo-social networks, ranked by a score function, gathering at one of the POIs from a set of POIs.



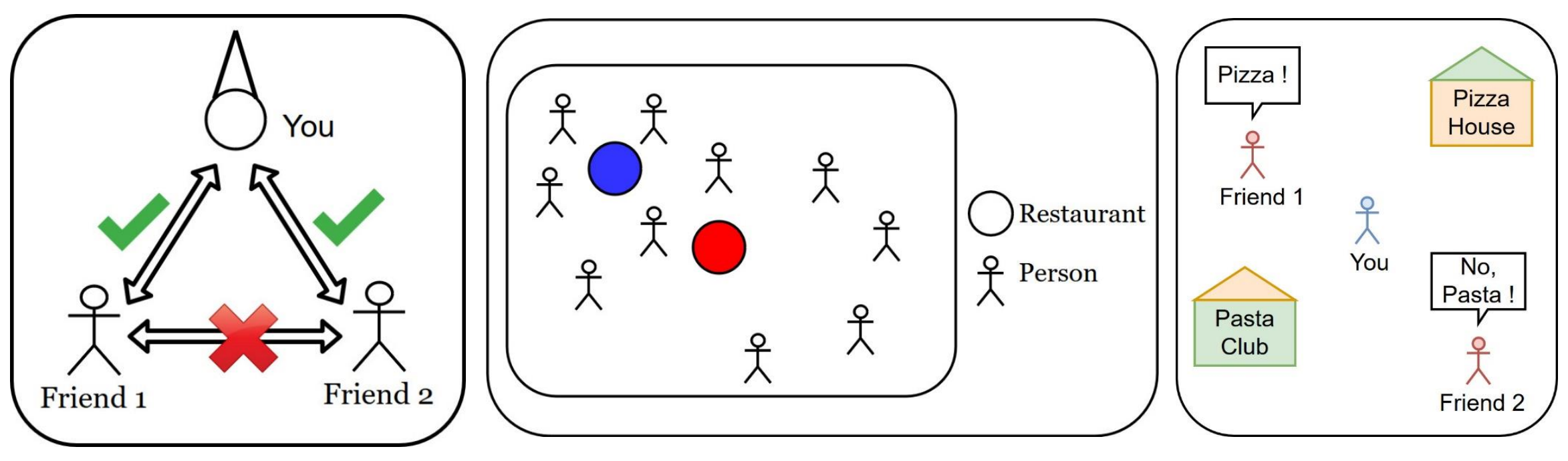
Social layer



Spatio-textual layer

2 RANKING CRITERIA

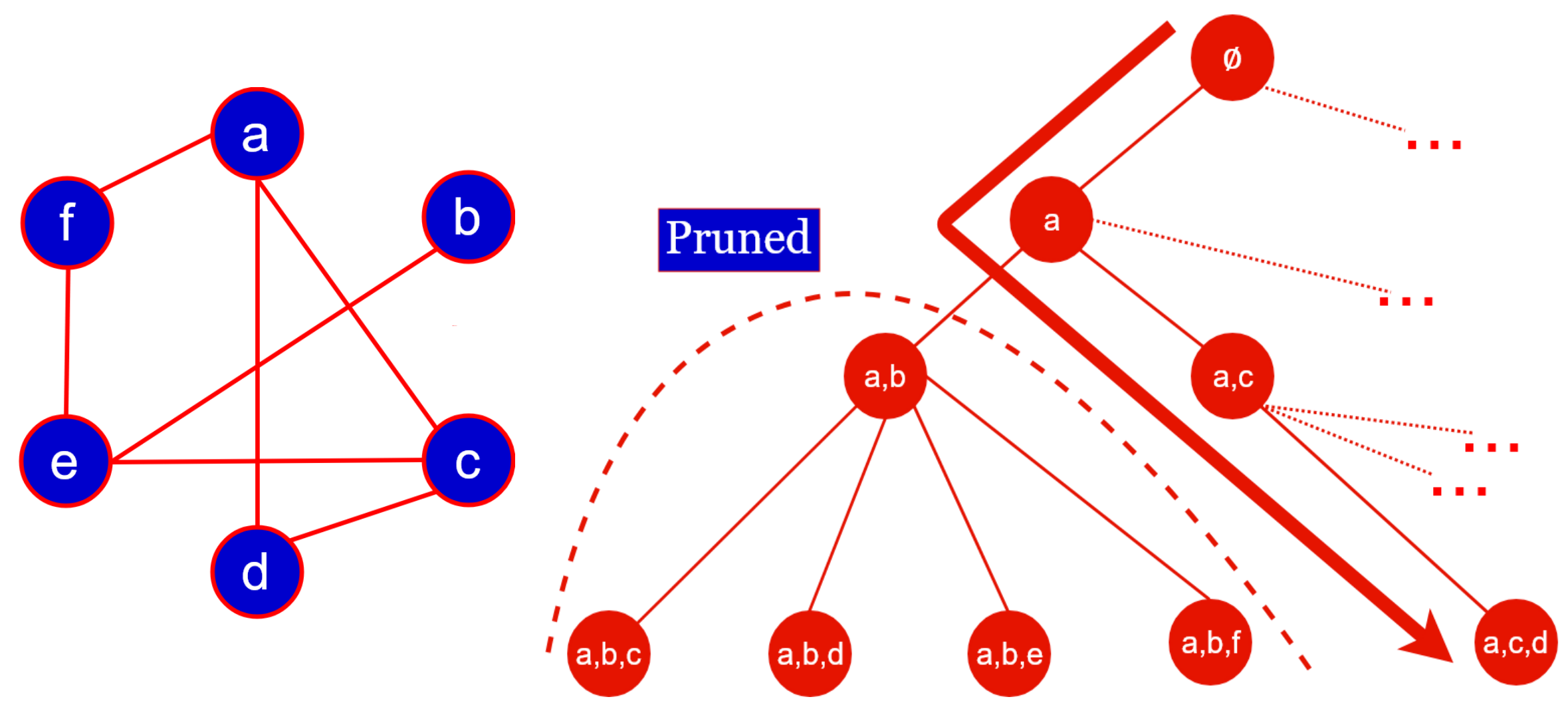
- ☐ Group size
    - the bigger, the better
- ☐ Social connectivity
    - the higher, the better
- ☐ Spatial distance
    - minimize total distance
- ☐ Similarity of attributes
    - maximal keyword matching



3 CONSTRAINTS

- ☐ Minimum group size, n'
- ☐ Maximum group size, n''
- ☐ Minimum social connectivity, c
- ☐ Maximum distance, d_{max}

4 PRUNING: IMPROVEMENT



5 OUR APPROACH

- ☐ A **Branch & Bound** algorithm
- ☐ Geo-textual indexing - **IR-Tree**
- ☐ **Incremental** development
- ☐ Theoretical **upper bounds**
- ☐ **Advanced termination** of search

We propose the Efficient Flexible Group Search (EFGS) algorithm

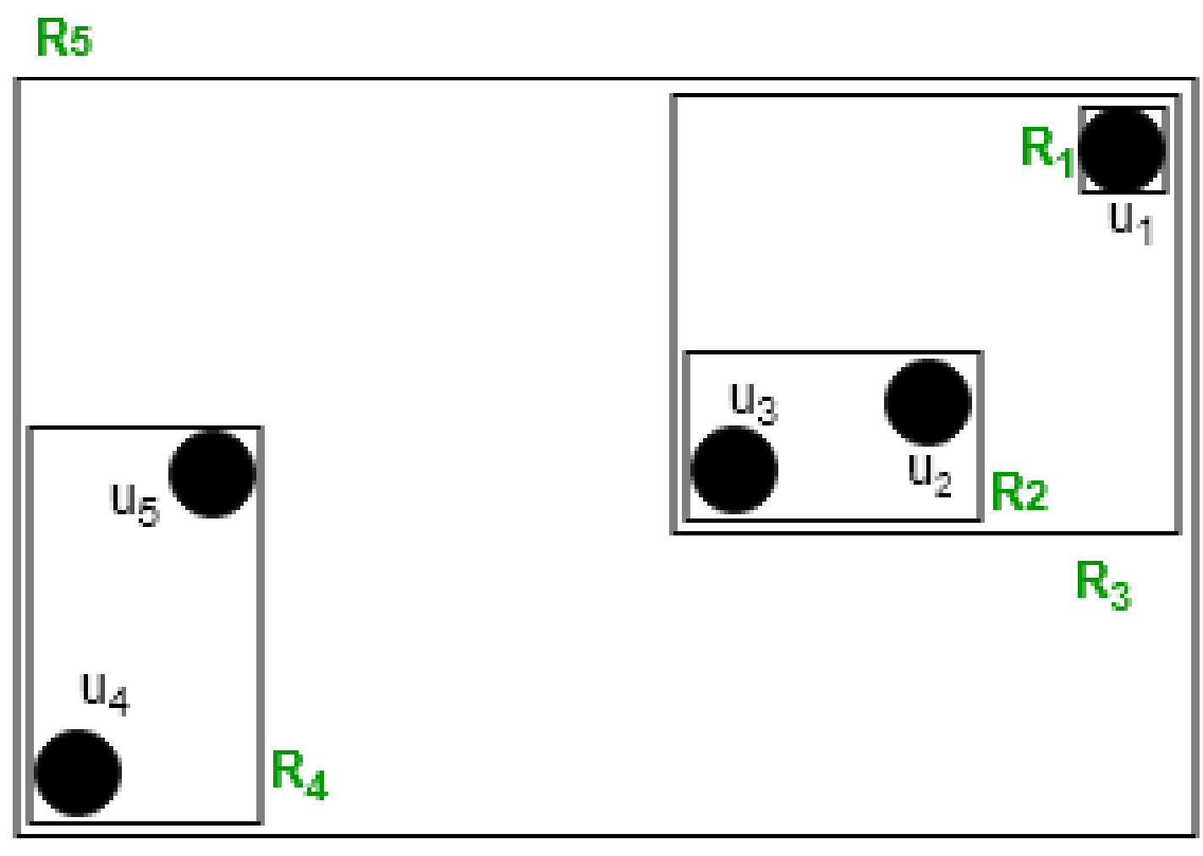
6 THE SCORE FUNCTION

Score S of a given graph $G' = (V', E')$ with respect to the corresponding meeting point q' is given by,

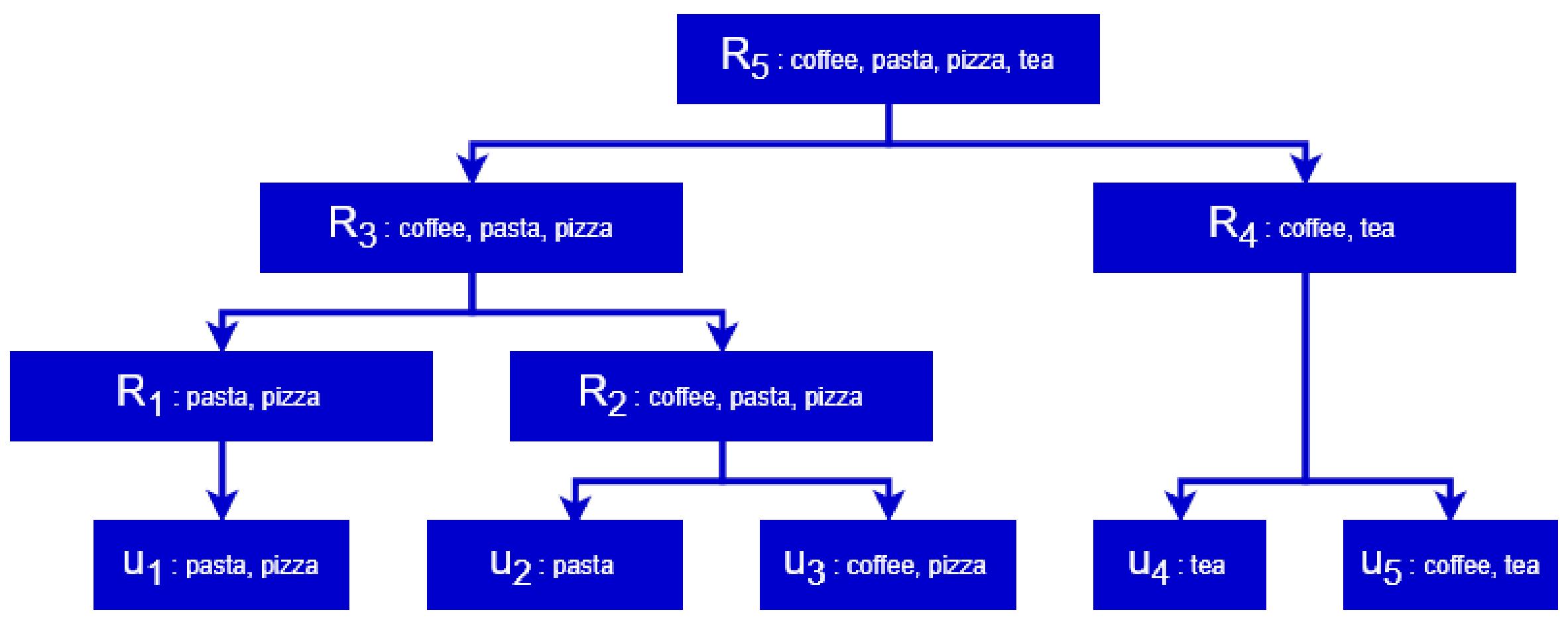
$$S = \alpha \cdot SCORE_{social} + \beta \cdot SCORE_{spatial} + \gamma \cdot SCORE_{keyword} + \theta \cdot SCORE_{size}$$

$$\text{Where, } \alpha + \beta + \gamma + \theta = 1$$

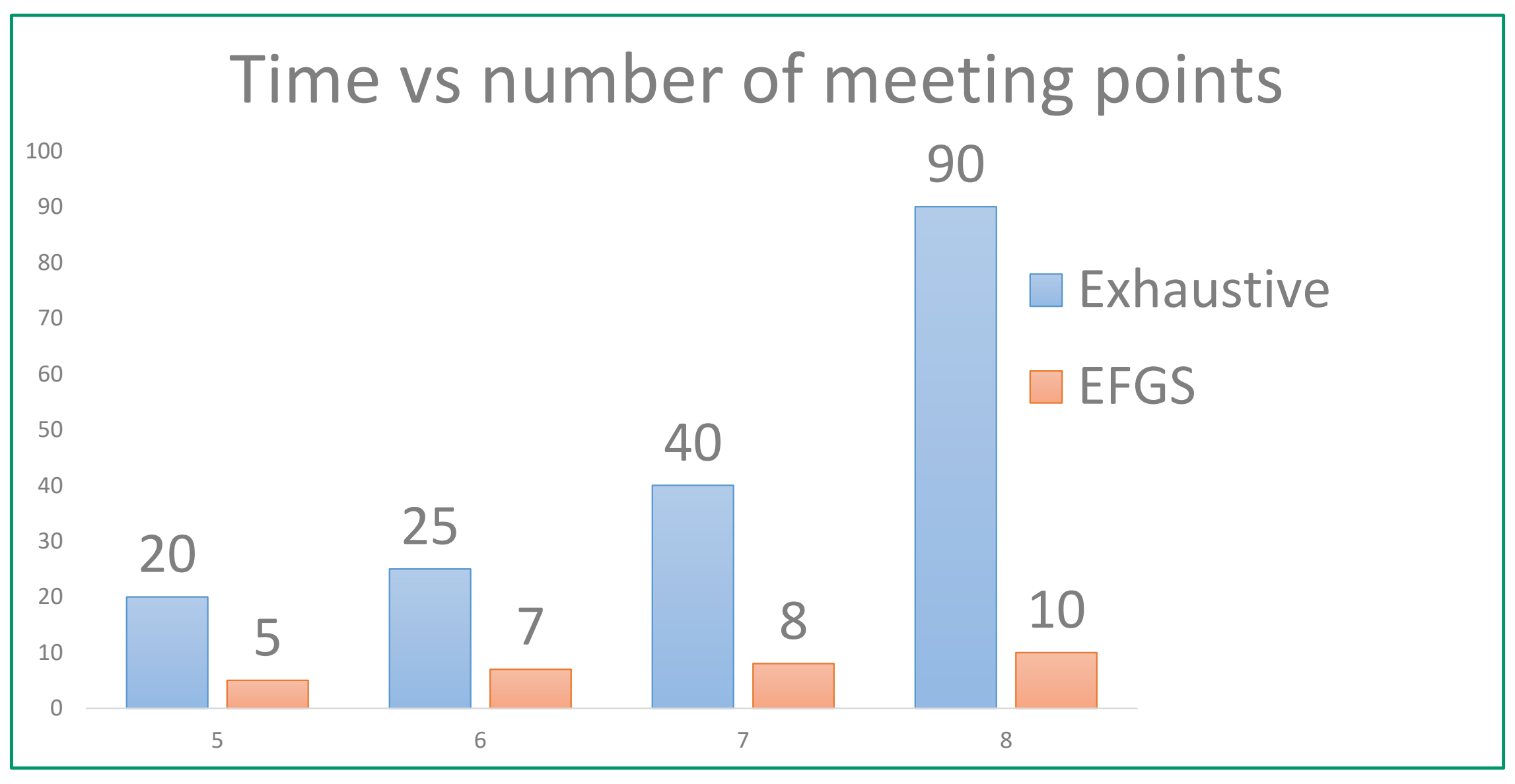
7 SOLUTION TO INDEXING: IR-TREE

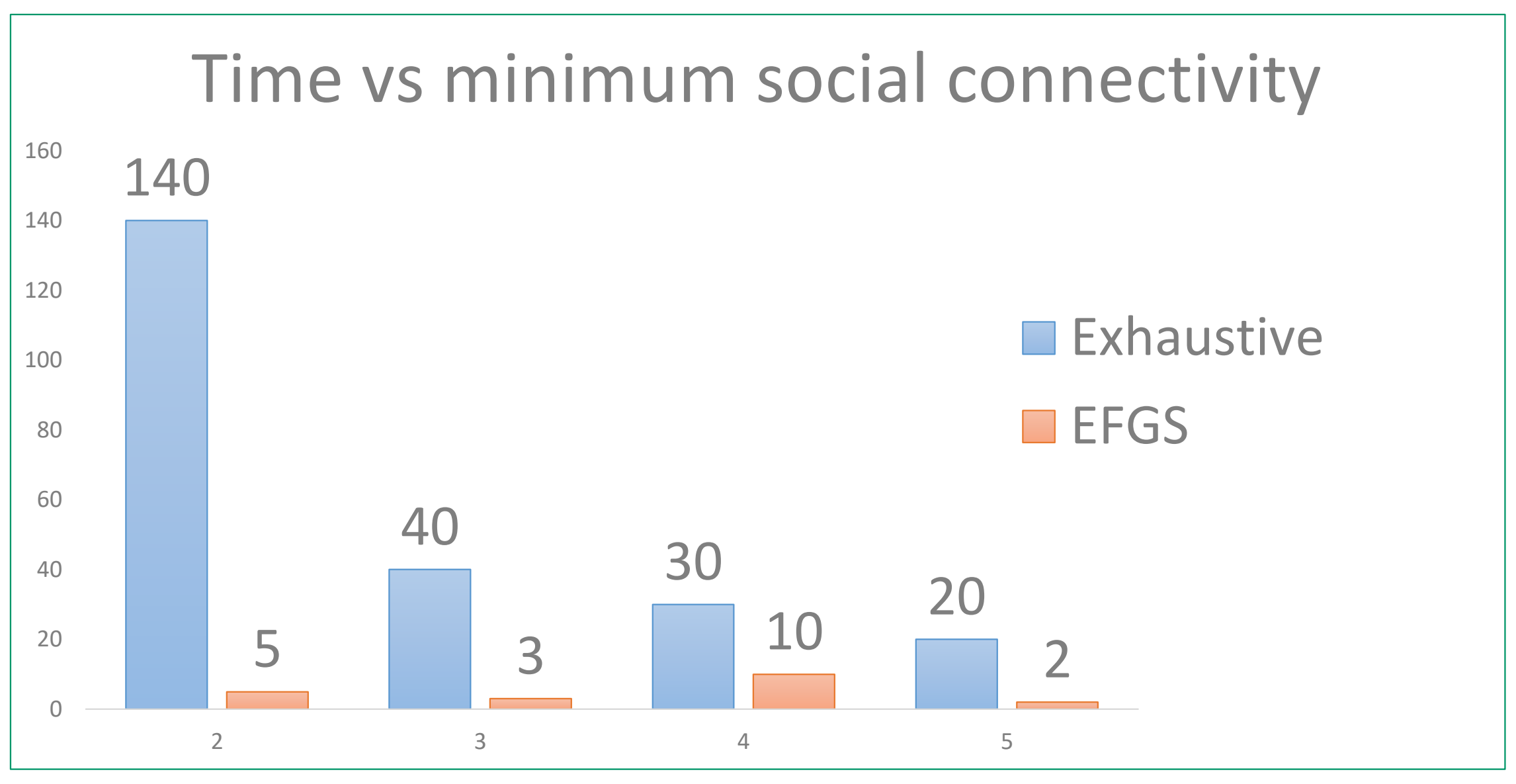


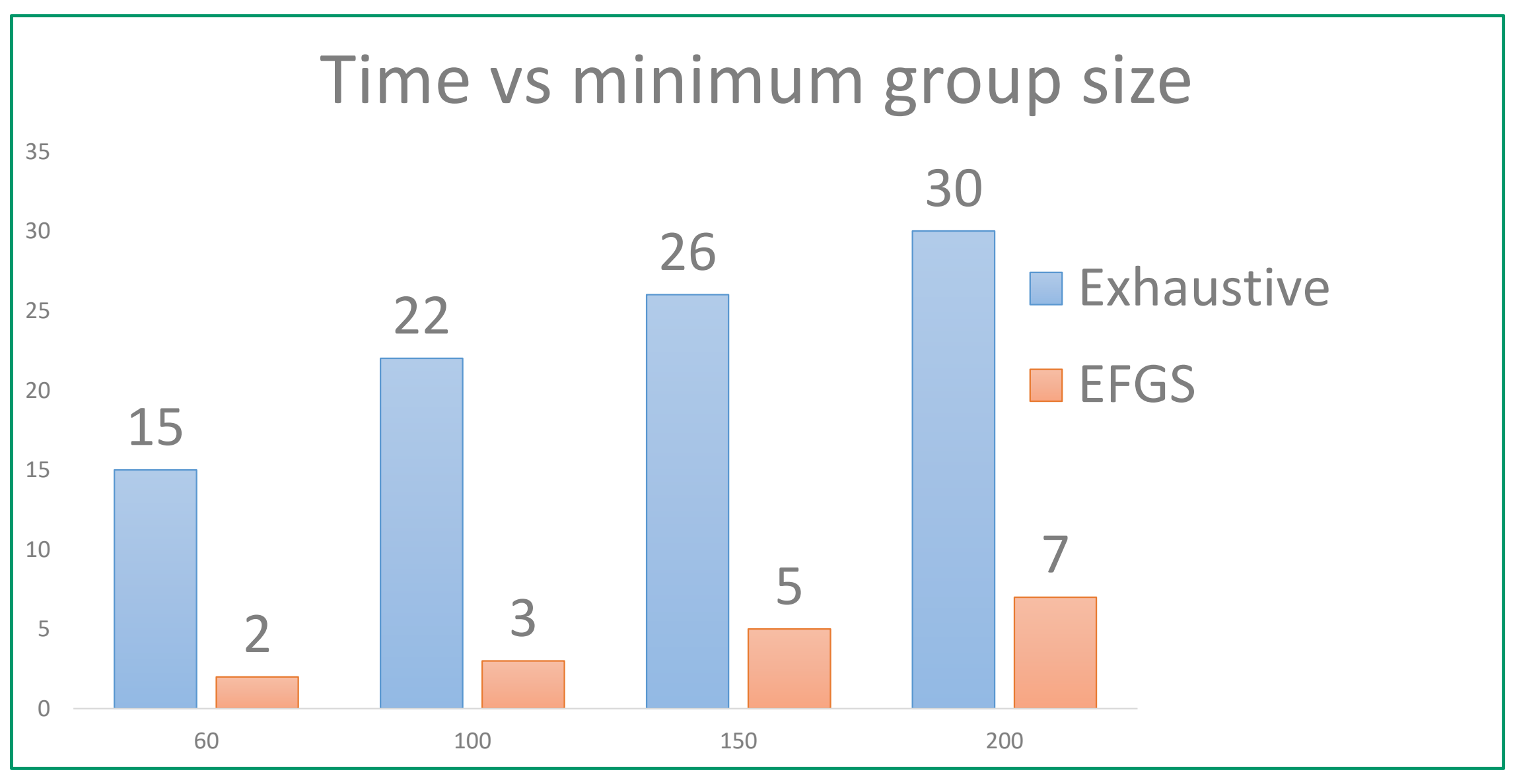
User	Keywords
u_1	pasta, pizza
u_2	pasta
u_3	pizza, coffee
u_4	tea
u_5	tea, coffee

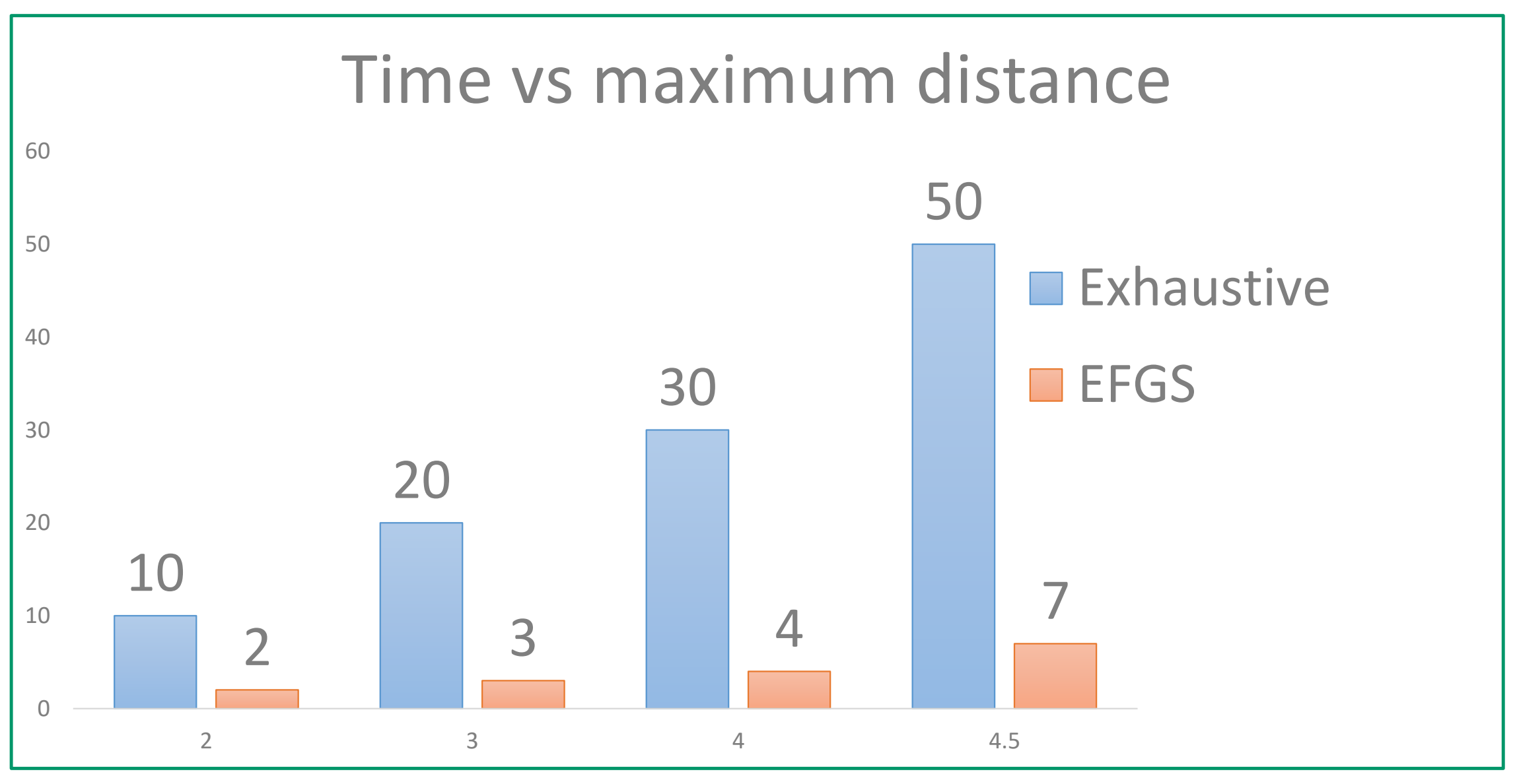


8 EXPERIMENTAL RESULTS









9 FUTURE WORKS

- ☐ An **Approximate** algorithm
    - Faster, maybe suboptimal
- ☐ Weighted social connections
- ☐ Negative-weighted keywords

References

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[3] Q. Zhu, H. Hu, J. Xu, and W. Lee, “Geo-social group queries with minimum acquaintance constraint”

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